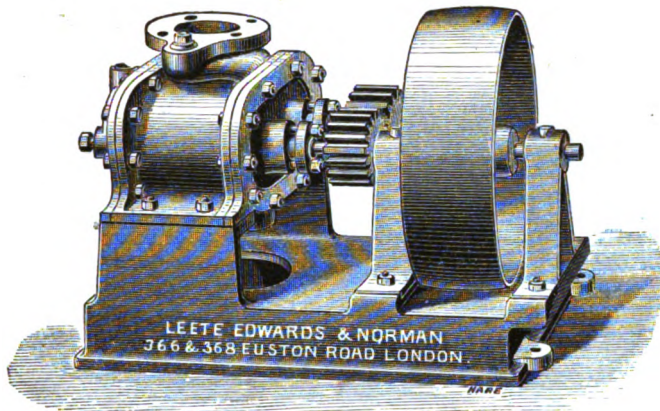
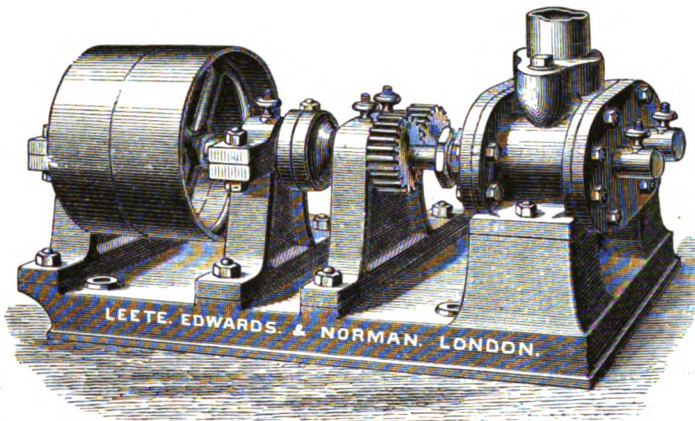


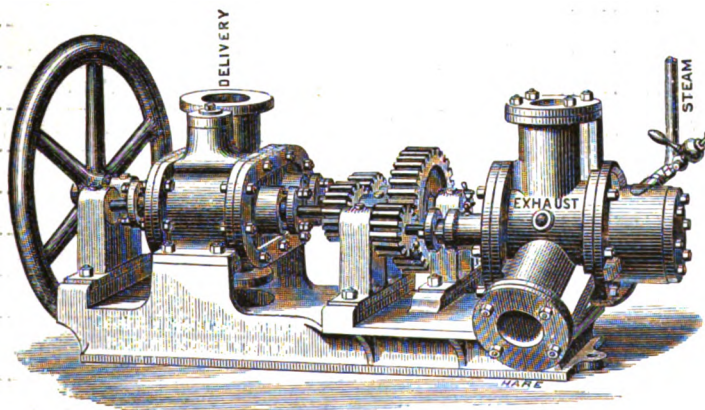
PATENT ROTARY PUMPS.



PUMP WITH SINGLE PULLEY.



PUMP WITH FAST-AND-LOOSE PULLEYS.

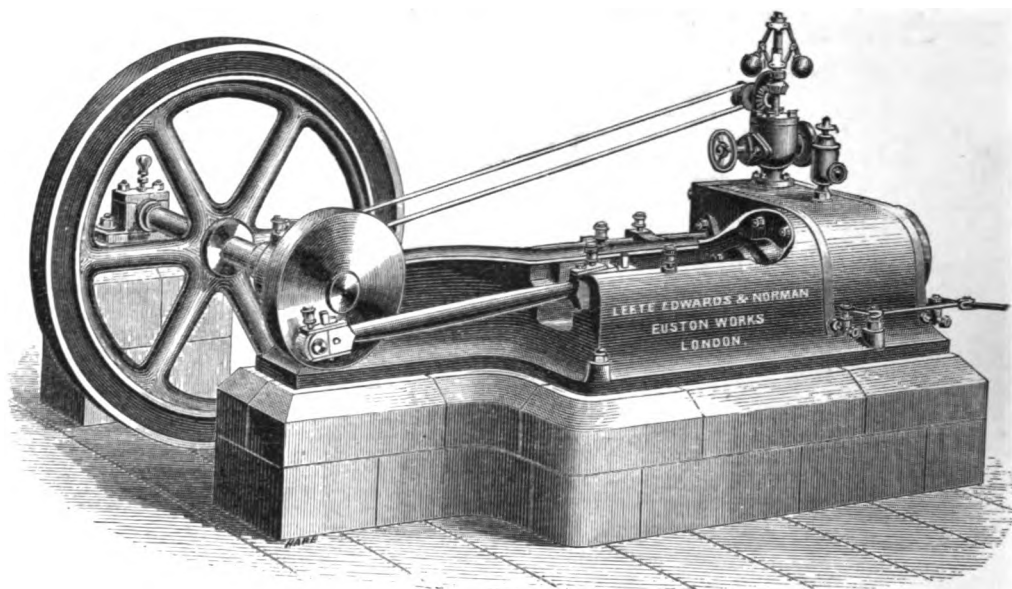


PUMP AND ENGINE COMBINED.

LEETE, EDWARDS, AND NORMAN,
ENGINEERS, EUSTON WORKS, 366 AND 368, EUSTON ROAD, LONDON, N.W.

3 H

HORIZONTAL HIGH-PRESSURE EXPANSIVE STEAM ENGINES.

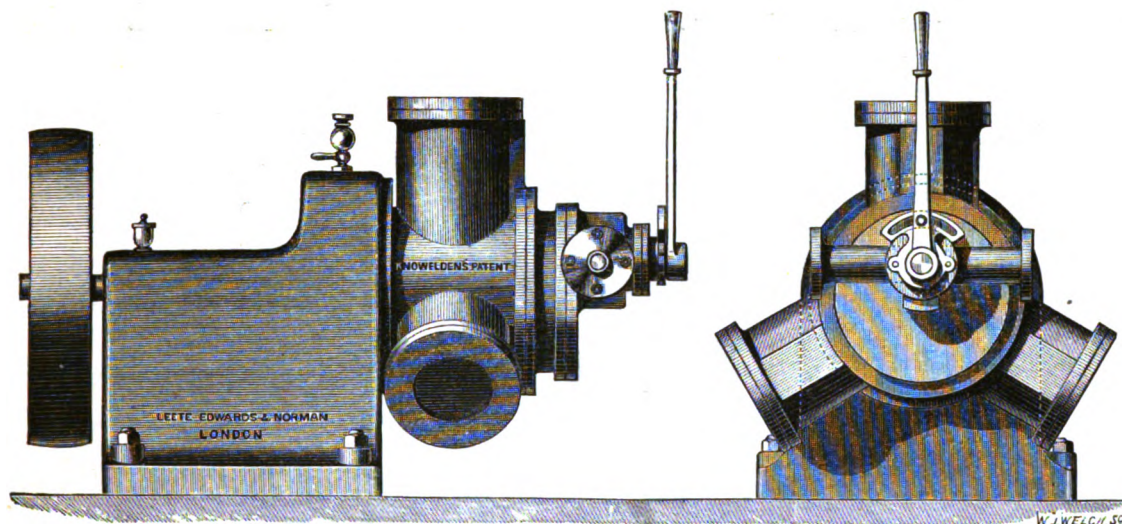


These Engines are made with the Bed Plate, front Cylinder Cover, Guides for Cross-head, and Plummer Block for Crank Shaft all in one casting. The Cylinder and Valve Chest are bolted on to the end of Bed Plate. The Cross-head, Guide Blocks, and Connecting Rod ends are adjustable, so that any wear can be very readily taken up. The Governor, Throttle Valve, and Starting Valve are combined, occupying but little space. The Governor is simple, compact, and sensitive. The Fly Wheel, Crank Shaft, and Disconnecting Rod, Cylinder Cover, Steam-Chest Cover, &c., &c., are all bright. The workmanship and materials are of the best throughout.

Size	1	2	3	4	5	6	7	8
Nominal Horse-power .. .	1	2	3	4	6	8	10	12
Indicated Horse-power at 50 lb. pressure in Boiler, 240 feet per minute cut off at half-stroke .. .	2	3.5	5.5	8.5	15	19	23.5	34.5
Diameter of Steam Cylinder .. .	3 in.	4 in.	5 in.	6 in.	8 in.	9 in.	10 in.	12 in.
Length of Stroke .. .	6 in.	8 in.	10 in.	12 in.	16 in.	18 in.	20 in.	24 in.
Revolutions per minute .. .	240	180	144	120	90	80	72	60
Diameter of Fly Wheel .. .	20 in.	30 in.	40 in.	48 in.	54 in.	60 in.	66 in.	72 in.
Weight of Fly Wheel .. .	2 cwt.	12 cwt.	32 cwt.	62 cwt.	92 cwt.	132 cwt.	19 cwt.	22 cwt.
Approximate weight of Engine ..	52 cwt.	10 cwt.	15 cwt.	25 cwt.	34 cwt.	48 cwt.	62 cwt.	105 cwt.
Price of Engine .. .	£34	£40	£48	£72	£93	£118	£150	£190
Feed Pump with Gun-Metal working parts, extra .. .	£4	£4 5s.	£5	£6	£6 10s.	£8 10s.	£11	£15
Variable Expansion Gear, extra ..	..	..	£10	£12	£14	£14	£15	£16

LEETE, EDWARDS, AND NORMAN,
ENGINEERS, EUSTON WORKS, 366 AND 368, EUSTON ROAD, LONDON, N.W.

PATENT THREE-CYLINDER ENGINES,



As Steam Engines, Hydraulic Engines, Gas Exhausters, Force Pumps, &c., &c.

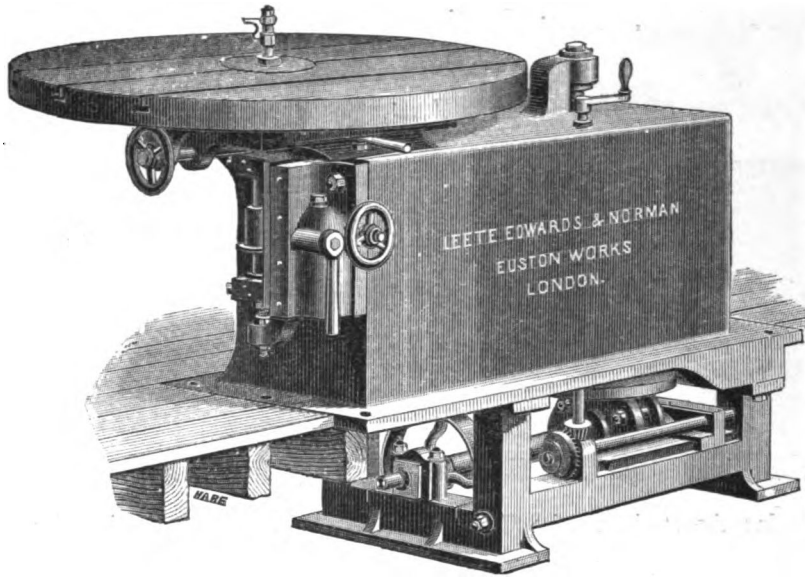
In this Engine the strain on the Crank Shaft is rendered constant in all positions of the Crank, and thus uniformity of action is obtained in every part of the Machine without the use of a Fly Wheel. There is no dead point, and the Engine will start from any position. The Engine consists of three Cylinders; steam is admitted in rotation by a single Valve; there are no Guides, Piston Rods, nor Glands; the working parts are comprised in the Pistons, Connecting Rods, Crank Shaft, and Valve. The cubic space occupied by this Engine is from one-fifth to one-tenth of that required for an ordinary Horizontal Engine; owing to this, the cost of foundations and erection is proportionally reduced. In consequence of the few parts, the wear and tear is reduced to a minimum. No dirt can enter the Engine, as all the working parts are entirely enclosed and protected from injury, but at the same time so readily accessible that the Engine can be entirely dismantled and reconnected in a few minutes. The cost will be found to compare very favourably with all other types. From the general design and small compass, it possesses the advantage of great portability. The construction admits of high speed, and is therefore particularly adapted for driving Circular Saws, Winches, Hoists, Pumps, Fans, Engineers' Tools, and all kinds of Centrifugal Machines, also for Screw Propellers, &c., &c., attached direct without intermediate gear. The Valve may be arranged to *cut off* at any part of the Stroke. The above Engraving represents the Engine with Reversing Gear, but Governors may be substituted, and, if desired, with Variable Expansion Gear.

Indicated Horse-power at a Piston speed of 300 feet per minute, and a mean Steam Pressure of 40 lb. per square inch	7	11	15	21.	30	35
Diameter of Cylinder in inches	4 in.	5 in.	6 in.	7 in.	8½ in.	9 in.
Length of Stroke	3 in.	4½ in.	5 in.	6 in.	7 in.	8 in.
Price of Engine with Starting Valve	£30	£45	£60	£80	£105	£115
Extra for Reversing Gear or Governors ..	£8	£10	£10	£12	£12	£15

The Piston speed of 300 feet per minute is merely assumed to calculate the indicated power.

LEETE, EDWARDS, AND NORMAN,
ENGINEERS, EUSTON WORKS, 366 AND 368, EUSTON ROAD, LONDON, N.W.

IRREGULAR SHAPING AND MOULDING MACHINE.

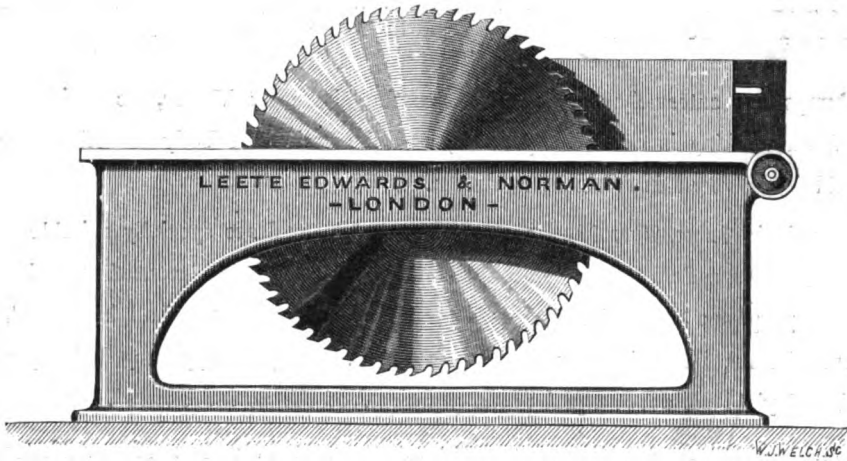


This Machine is well adapted for Planing, Moulding, Shaping, and Rebating all kinds of straight, curved, and irregular forms, and is expressly suitable for Cabinet Makers, Railway Carriage Shops, &c., &c. It has a Vertical Spindle carrying the Cutter, and the Spindle can be raised or lowered at pleasure from the hand-wheel at the right-hand side. The Cutter Spindle can be reversed, and the speed regulated by simply turning the handle (shown at top of Machine). The table top is provided with T grooves for readily setting any fence, &c. It is also adjustable from the hand-wheel in front, thus regulating the cut, a very important arrangement when cutting large mouldings, by which much time is saved and better work produced. There is a self-acting feed arrangement for straight mouldings; this can be lowered under the table when the Machine is required for other work. The whole is self contained, as shown above. Can be conveniently fixed either on floor or brickwork foundation, with all straps, &c., enclosed.

Full Particulars on application to

LEETE, EDWARDS, AND NORMAN,
ENGINEERS, EUSTON WORKS, 366 AND 368, EUSTON ROAD, LONDON, N.W.

SAW BENCHES.



The Main Frame of these Benches is all in one casting, by which great strength and stiffness are obtained. - The Bearings in which the Spindle runs are of extra length, and special arrangements made for lubricating. These Benches are fitted with Fast-and-Loose Pulleys, adjustable Fences, with canting arrangements for any angle.

Tables.	Average Power.	Diameter of Pulleys.	Speed of Saw Spindle.	Diameter of Saw.	To cut.	Price.
ft. in. ft. in. 3 6 x 2 0	1	inches. 9	revolut' ons. 1800	inches. 15	inches. 6	£ 22
4 6 „ 2 6	3	12	1500	24	9	28
5 6 „ 2 9	6	14	1000	36	14	38
6 0 „ 3 0	7	15	900	42	17	45
7 0 „ 3 6	8	16	800	48	20	55

MAKERS OF SPECIAL TOOLS FOR WOOD CUTTING.

ALSO

MACHINES FOR LUCIFER-MATCH MAKING

(BOTH WAX AND WOOD).

Full Particulars on application to

LEETE, EDWARDS, AND NORMAN,

ENGINEERS, EUSTON WORKS, 366 AND 368, EUSTON ROAD, LONDON, N.W.

PATENT ROTARY PUMPS.

SPECIALTY FOR TAR, OILS, SEMI-LIQUIDS, AQUARIA, &c., &c.

These Pumps are extremely simple in construction, have no Valves, no reciprocating parts; the friction when working is exceedingly small, and the action perfectly smooth, while the water or other liquid is delivered in a constant stream.

They are made in IRON, GUN METAL, **Vulcanite**, &c., and are specially suitable for pumping **Oils, Acids, Gas Tar, Dyes, Brewers' Wort**, also for **Vinegar Breweries**, and **Sea Water** for **Aquarium** purposes, &c., and are therefore adapted to the wants of all kinds of Traders and Manufacturers who require a simple and effective Pump. They occupy very little space, are very durable, and will yield an effect equal to 80 per cent. of the power exerted.

The undermentioned sizes are always either in stock, or in course of manufacture. Larger sizes can be made without impairing the efficiency. They are made with Single Pulley, Fast-and-Loose Pulleys, Steam Engine combined on the same Bed Plate with Pump, or can be arranged to be driven by other power.

No of Pump.	Diameter of Pipes, Suction and Delivery.	Gallons raised per hour.	Power to raise the said number of Gallons 1 foot high.*	Revolutions per minute.	Price of Pump in Iron with Fast-and-Loose Pulleys.	Price of Pump in Gun Metal with Fast-and-Loose Pulleys.	Price of Pump in Vulcanite with Fast-and-Loose Pulleys.	Price of Engine and Pump combined.
1	inches. 1	500	·004	250	£ 15	£ 19	£ 21	£ ..
2	2	2,000	·018	250	20	26	28	65
3	3	4,500	·037	200	30	40	42	..
4	4	7,500	·063	200	40	50	54	110
5	5	12,500	·105	150	50	..	..	..
6	6	18,000	·151	150	60	..	..	155

These prices may vary, depending on the size of Engine required.

NOTE.—If with additional Standard, Coupling Spindle and Coupling, £4 extra.

* To ascertain the power required for any height of lift, multiply the horse-power given in the fourth column of this Table by the height in feet above the source of supply, the product is the total horse-power required, unless the length of pipe or number of bends is very great, in which case a special calculation is necessary.

ALL KINDS OF VULCANITE COCKS AND FITTINGS FOR ACID WORKS, AQUARIA, VINEGAR BREWERIES.

Full Particulars on application at the Works.

LEETE, EDWARDS, AND NORMAN,
ENGINEERS, EUSTON WORKS, 366 AND 368, EUSTON ROAD, LONDON, N.W.